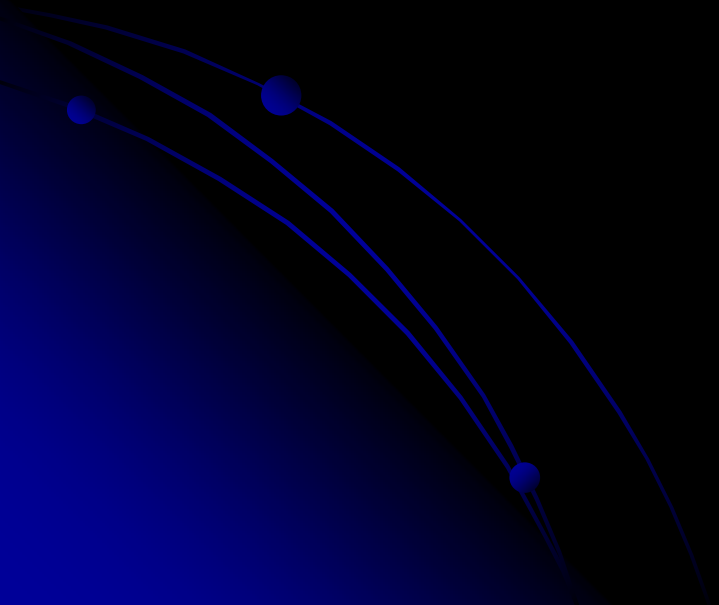


Presented by:

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Getting Beyond Waste by Putting Resources to Work

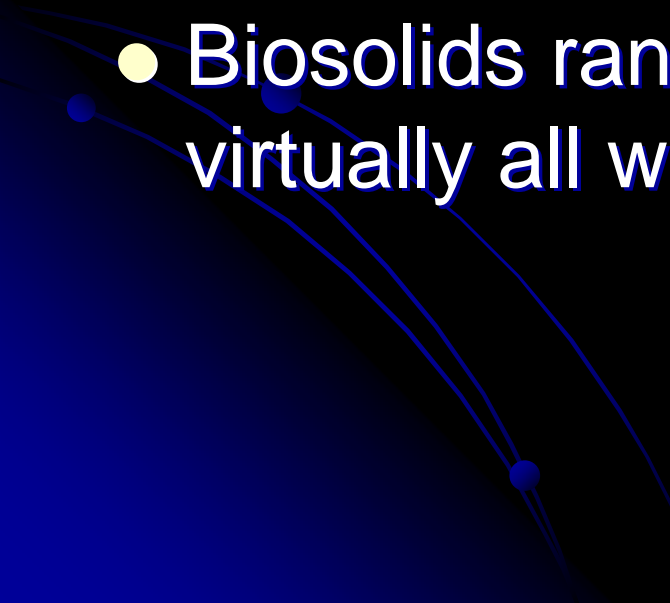
“B” is for Biosolids



What are biosolids?

- One of two primary products of wastewater treatment
- Residual solids generated in the treatment of wastewater
- Not raw sewage
- Derived from the treatment of domestic sewage
- Not industrial/chemical sludges
- Term used similarly around the country
- Includes septage

How are Biosolids Made?

- There are many treatment systems.
 - Clarifier, digester, dewatering (typical)
 - Biosolids result from a conversion
 - They are a biological product
 - Biosolids range from extremely dry to virtually all water
- 

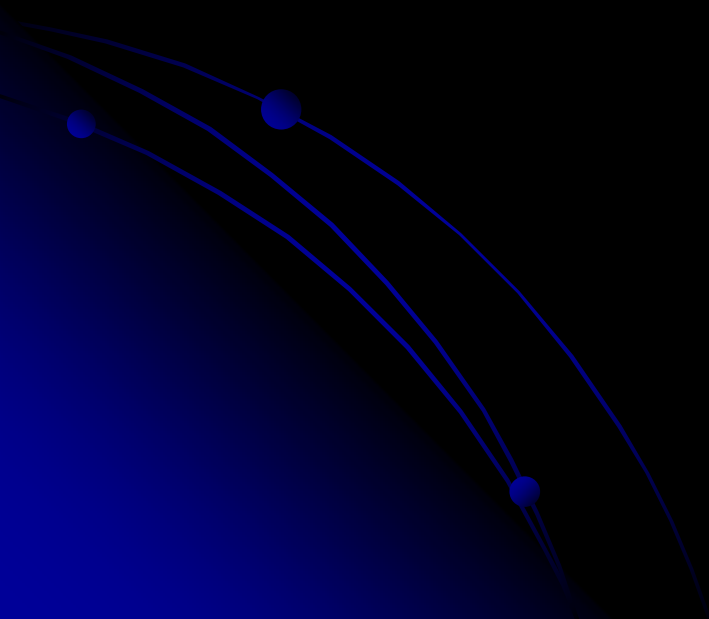
How much do we make?

In Washington

- Around 115,000 dry tons per year
- About 19,000 is incinerated
- About 4,000 is landfilled
- About 92,000 is land applied
 - Most of that goes to agricultural land

Why Land Apply Biosolids?

- We really have three options
 - Use them
 - Burn them
 - Bury them

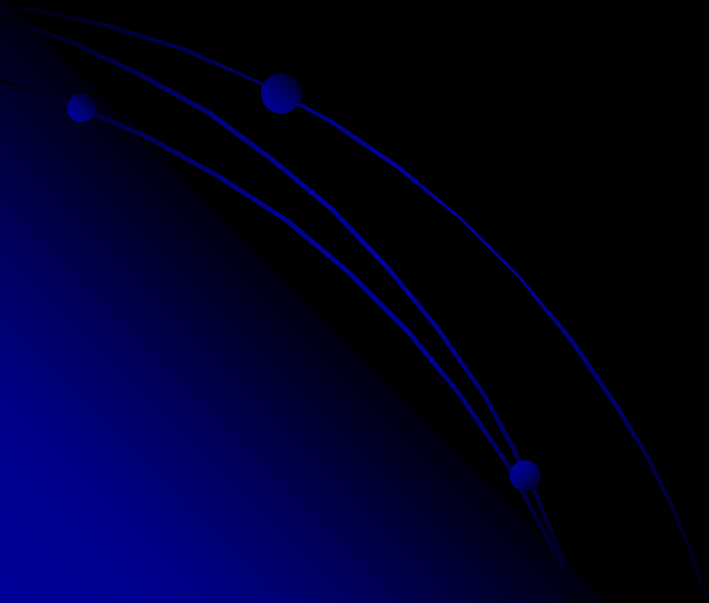


Preferred Alternative

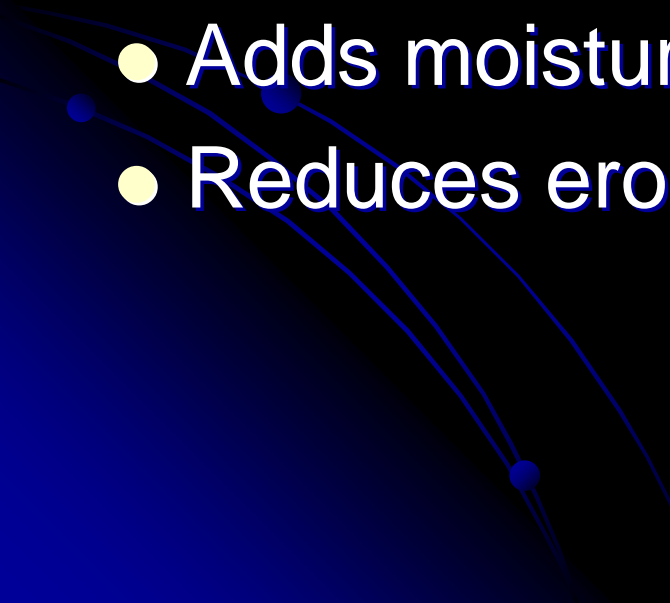
- State law (1992) established biosolids as a valuable commodity and directed WDOE to maximize beneficial use
- Disposal and incineration rank as the least preferred options per state laws
- Using biosolids beneficially is seen as a good thing

What can we do with biosolids

- Agricultural Land
- Forest Land
- Drastically Disturbed Sites
- Landscaping



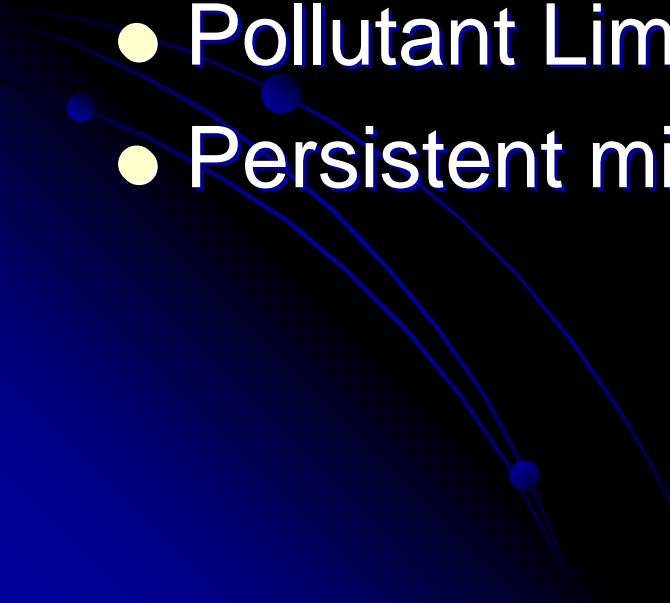
What are the benefits?

- Improves soil tilth
 - Conserve macro and micro nutrients
 - Adds organic matter
 - Improves moisture retention
 - Adds moisture
 - Reduces erosion
- 

??? A typical application of dewatered solids looks like:

- A) Less than an inch of material – kind of like scattering soil with a shovel
- B) About 1-2 inches of material – kind of like top dressing a lawn
- C) About 4-6 inches of material – kind of like topsoil for a new lawn
- D) About 8-10 inches of material – kind of like a new garden bed

What are the Issues?

- People equate biosolids with "poop" (or some other four letter word)
 - Odor can be a trigger
 - Pathogen Reduction
 - Pollutant Limits
 - Persistent misinformation
- 

Risk Assessment

- EPA did a comprehensive evaluation of risks associated with biosolids management in the late 80s and early 90s
- Started with over 400 pollutants of concern; whittled down to 9
- Key was cumulative loading
- Also addressed pathogen and vector attraction reduction in rule making

Where's the dirt?

Pollutant	Upper Limit		Lower Limit		Typical***	
Arsenic						
Cadmium						
Copper						
Lead						
Mercury						
Molybdenum						
Nickel						
Selenium						
Zinc						

*** Quick estimates from 2004-2005 data – not official

Original Motivation

- Land application was less costly
- Landfilling (or incineration) more costly
- Force facilities to clean up biosolids to continue least cost alternative
- National pretreatment program
- Cleaner influent
- *Here's your punch line...*
- Cleaner biosolids & *cleaner effluent*



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**AREA CLOSED
FOR RESTORATION**
Habitat Enhancement Project
Tacoma Parks



West Page Swamp- Bunker Hill, ID Before



West Page Swamp-
Bunker Hill, ID
During- 1998



West Page Swamp-
Bunker Hill, ID
After- 2005- See it shine!



Jasper County, MO Before



Jasper County, MO During- 2000



Jasper County, MO After- 2003 Pretty Nice!



Leadville, CO Before- 1997



Leadville, CO During



Leadville, CO
After- 2005- A Stunner!







The End

